Wisconsin Natural Heritage Inventory (NHI)

Recognized Natural Communities – Working Document

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This document will be periodically updated and expanded. Future editions will include or be linked to additional descriptive information, range maps, and crosswalks to other vegetation classification systems.

Alder Thicket

These wetlands are dominated by thick growths of tall shrubs, especially speckled alder (Alnus incana). Among the common herbaceous species are Canada bluejoint grass (Calamagrostis canadensis), orange jewelweed (Impatiens capensis), several asters (Aster lanceolatus, A. puniceus, and A. umbellatus), boneset (Eupatorium perfoliatum), rough bedstraw (Galium asprellum), marsh fern (Thelypteris palustris), arrow-leaved tearthumb (Polygonum sagittatum), and sensitive fern (Onoclea sensibilis). This type is common and widespread in northern and central Wisconsin, but also occurs in the southern part of the state.

Algific Talus Slope

This rare community of southwestern Wisconsin's Driftless Area consists of steep slopes of fractured limestone (dolomite) rock that retains ice and emits cold air throughout the growing season. The cold microhabitats enable the persistence of northern species and "periglacial relicts" such as northern monkshood (Aconitum noveboracense) and rare terrestrial snails. The woody overstory is often sparse, with scattered small black ash (Fraxinus nigra) and white birch (Betula papyrifera). Mountain maple (Acer spicatum), a northern shrub, may be frequent and extensive beds of bulblet fern (Cystopteris bulbifera) and mosses are characteristic.

Alkaline Clay Bluff (now called Clay Seepage Bluff)

Alvar

This rare community consists of areas of thin discontinuous soil overlying horizontal beds of limestone or dolomite in the vicinity of Great Lakes shorelines. They are characterized by relatively low tree cover and a distinctive biota which includes elements of rock pavement, prairie, savanna and boreal forest communities. Among these are regional endemics, some very rare. This community type is much more common and better-developed in Michigan and Ontario than in Wisconsin. Small coniferous and deciduous trees (cedar, fir, pine, oak, aspen, birch) are scattered among an assemblage of species that can include big bluestem (Andropogon gerardii), little bluestem (Schizachyrium scoparium), Indian-grass (Sorghastrum nutans), and wood lily (Lilium philadelphicum), as well as shoreline plants such as silverweed (Potentilla anserina) and dwarf lake iris (Iris lacustris).

Bedrock Glade

These are xeric, sparsely vegetated non-vertical bedrock exposures with very thin, often discontinuous soils. The rock types vary from quartzite (Baraboo Hills, McCaslin Mountain), to basalt (lower St. Croix River valley), to granite (northeastern Wisconsin). The flora can include prairie, savanna, or barrens components, some at their northern range limits. Trees and shrubs are sparse and may include pines, oaks, and cherries. Xerophytic pteridophytes such as rusty woodsia (Woodsia ilvensis) and rock spikemoss (Selaginella rupestris) are characteristic, as are lichens and mosses.

Bedrock Shore

Wave-splashed bedrock shoreline ledges are best developed on sandstone in the Apostle Islands of Lake Superior. Stunted trees of white cedar (Thuja occidentalis), white birch (Betula papyrifera), showy mountain-ash (Sorbus decora) and green alder (Alnus crispa) are often present in crevices. Common herbs are ticklegrass (Agrostis hyemalis), fireweed (Epilobium angustifolium), and Canada goldenrod (Solidago canadensis), but the flora often includes unusual plants such as bird's-eye primrose (Primula mistassinica), brook lobelia (Lobelia kalmii), and three-toothed cinquefoil (Potentilla tridentata).

Black Spruce Swamp (A split from Curtis' Northern Wet Forest)

An acidic conifer swamp forest characterized by a relatively closed canopy of black spruce (Picea mariana) and an open understory in which Labrador-tea (Ledum groenlandicum) and sphagnum mosses (Sphagnum spp.) are often prominent, along with three-leaved false Solomon's-seal (Smilacina trifolia), creeping snowberry (Gaultheria procumbens), and three-seeded sedge (Carex trisperma). The herbaceous understory is otherwise relatively depauperate. This community is closely related to Open Bogs and Muskegs, and sometimes referred to as Forested Bogs outside of Wisconsin.

Bog Relict

These boggy, acidic, weakly minerotrophic peatlands occur south of the Tension Zone within a matrix of "southern" vegetation. Bog relicts are isolated from the more extensive, better-developed and much more widespread stands of this community found in the northern part of the state. Acidophiles present can include sphagnum mosses (Sphagnum spp), sedges (e.g., few seeded sedge, Carex oligosperma), ericaceous shrubs, and insectivorous herbs. Tamarack (Larix laricina) is usually the most common tree and poison-sumac (Toxicodendron vernix) is often formidably abundant in the understory, especially in the moat (or "lagg") at the upland/wetland interface. Examples in southeastern Wisconsin are all somewhat alkaline and may resemble "shrub-fen" communities described in other states.

Boreal Forest

In Wisconsin, mature stands of this forest community are dominated by white spruce (Picea glauca) and balsam-fir (Abies balsamea), often mixed with white birch (Betula papyrifera), white cedar (Thuja occidentalis), white pine (Pinus strobus), balsam-poplar (Populus balsamifera) and quaking aspen (Populus tremuloides). Mountain-ash (Sorbus spp.) may also be present. Common understory herbs are large-leaved aster (Aster macrophyllus), bluebead lily (Clintonia borealis), Canada mayflower (Maianthemum canadense), wild sarsaparilla (Aralia nudicaulis), and bunchberry (Cornus canadensis). Most Wisconsin stands are associated with the Great Lakes, especially the clay plain of Lake Superior, and the eastern side of the northern Door Peninsula on Lake Michigan. Of potential interest from the perspectives of vegetation classification and restoration, white pine had the highest importance value of any tree in the Lake Superior region, as recorded during the original land survey of the mid-1800's.

Boreal Rich Fen

Neutral to alkaline cold open peatlands of northern Wisconsin through which carbonate-rich groundwater percolates. Sphagnum mosses are absent or of relatively minor importance, as calciphilic species (especially the "brown" mosses) predominate. Dominant/characteristic plants include woolly sedge (Carex lasiocarpa), twig rush (Cladium mariscoides), beaked bladderwort (Utricularia cornuta), rushes (Juncus spp.), and Hudson Bay cotton-grass (Scirpus hudsonianus). Shrubby phases also occur, with bog birch (Betula pumila), sage willow (Salix candida), and speckled alder (Alnus incana) present in significant amounts.

Bracken Grassland

These are open upland areas, in northern Wisconsin on sandy soils, dominated by bracken fern (Pteridium aquilinium), Penn sedge (Carex penyslvanica), Kalm's bromegrass (Bromus kalmii), and Canada bluegrass (Poa compressa). There may be a high cover of low shrubs such as blueberries (Vaccinium angustifolium and V. myrtilloides), sweet fern (Comptonia peregrina), prairie willow (Salix humilis), and hazelnuts (Corylus spp.). Other common herbs include poverty oat-grass (Danthonia spicata), Lindley's aster (Aster ciliolatus), gray goldenrod (Solidago nemoralis), and common strawberry (Fragaria virginiana). Exotics are often frequent. There is disagreement on whether bracken grassland should be considered a "natural community" in Wisconsin and elsewhere in the Upper Great Lakes region.

Calcareous Fen

An open wetland found in southern Wisconsin, often underlain by a calcareous substrate, through which carbonate-rich groundwater percolates. The flora is typically diverse, with many calciphiles. Common species are several sedges (Carex sterilis and C. lanuginosa), marsh fern (Thelypteris palustris), shrubby cinquefoil (Potentilla fruticosa), shrubby St. John's-wort (Hypericum kalmianum), Ohio goldenrod (Solidago ohioensis), grass-of-parnassus (Parnassia glauca), twig-rush (Cladium mariscoides), brook lobelia (Lobelia kalmii), boneset (Eupatorium perfoliatum), swamp thistle (Cirsium muticum), and asters (Aster spp.). Some fens have significant prairie or sedge meadow components, and intergrade with those communities.

Cedar Glade

Dry sandstone, quartzite or dolomite exposures vegetated with dense thickets of red cedar (Juniperus virginiana). Red maple (Acer rubrum), Paper birch (Betula papyrifera) and black and bur oaks (Quercus velutina and Q. macrocarpa) may also be present. This community is usually if not always the result of fire suppression on dry prairies, and in pre-settlement times it may have occurred only where extensive cliffs served as firebreaks. Common herbs include bluestem and grama grasses (Andropogon spp. and Bouteloua spp.), prickly-pear cactus (Opuntia compressa), flowering spurge (Euphorbia corollata), stiff sandwort (Arenaria stricta) and gray goldenrod (Solidago nemoralis).

Central Poor Fen

These open, acidic, low nutrient peatlands occur within the Central Sand Plains of Wisconsin. Central poor fens are floristically depauperate and generally sedge dominated, (Carex oligosperma, C. lasiocarpa, and C. utriculata) Bluejoint grass (Calamagrostis canadensis) is a frequent associate and may co-dominate in some stands. Sphagnum spp. carpets are common but typically lack pronounced hummocks and hollows. Shrubs are present but not dominant, Hard-hack (Spirea tomentosa) is the most consistent in presence, and cover of ericads is generally low. Other characteristic associates include wool grass (Scirpus cyperinus), cotton-grasses (Eriophorum spp.), swamp-candles (Lysimachia terrestris) and Kalm’s St. John’s-wort (Hypericum kalmianum). This community often intergrades with Tamarack (poor) Swamp. Disturbance of this community through mossing may significantly alter community composition, as recolonization by at least some of the vascular plants is very slow. Many plants characteristic of poor fen communities farther north are rare or absent in these central sands peatlands.

Central Sands Pine-Oak Forest

This forest community is associated with the Central Sands ecoregion on dry to dry-mesic sites with acid sandy soils. The dominants are white and red pines (Pinus strobus and P. resinosa), oaks (Quercus alba, Q. rubra, and Q. velutina), and on dry-mesic sites, red maple (Acer rubrum). The understory is typically depauperate consisting primarily of huckleberry (Gaylussacia baccata), early blueberry (Vaccinium angustifolium), bracken fern (Pteridium aquilinium), wood anemone (Anemone quinquefolia) and Penn sedge (Carex pensylvanica). Jack pine (Pinus banksiana) is sometimes co-dominant on the driest sites (jack pine – black / Hills oak dominated stands maybe split out in the future).

Coastal Fen (now called Shore Fen)

Coastal Plain Marsh

Sandy to peaty-mucky lakeshores, pondshores, depressions, and ditches in and around the bed of extinct glacial Lake Wisconsin may harbor assemblages of wetland species including some which are significantly disjunct from their main ranges on the Atlantic Coastal Plain. There is often a well-developed concentric zonation of vegetation. Frequent members of this community are sedges in the genera Cyperus, Eleocharis, Fimbristylis, Hemicarpha, Rhynchospora and Scirpus; rushes (Juncus spp.); milkworts (Polygala cruciata and P. sanguinea), toothcup (Rotala ramosior), meadow-beauty (Rhexia virginica), grass-leaved goldenrod (Euthamia graminifolia), hardhack (Spiraea tomentosa), lance-leaved violet (Viola lanceolata), and yellow-eyed grass (Xyris torta).

Clay Seepage Bluff (formerly called Alkaline Clay Bluff)

Steep, clay bluffs occur along some stretches of the Great Lakes shorelines and less commonly inland on streams draining into Lake Superior and Lake Michigan. Vegetative cover ranges from forested with pines (Pinus resinosa and P. strobus), white cedar (Thuja occidentalis) and white birch (Betula papyrifera), to bare clay with only a few herbs present. Buffaloberry (Sheperdia canadensis) is a characteristic shrub, but more typically, alders (Alnus incana and A. crispa), as well as herbs such as Canada goldenrod (Solidago canadensis) and pearly everlasting (Anaphalis margaritacea) are dominant. Both native and exotic pioneers such as fireweed (Epilobium angustifolium) and Canada thistle (Cirsium arvense) are common, especially on unstable sites. But it is the semi-stabilized "weeping" bluffs that are of the greatest biological interest. Golden sedge (Carex aurea), orchids and calciphilic fen species may colonize such sites, which can be local repositories of rare or otherwise noteworthy species.

Dry Cliff (**Exposed Cliff** of Curtis' community classification)

These dry vertical bedrock exposures occur on many different rock types, which may influence species composition. Scattered pines, oaks, or shrubs often occur. However, the most characteristic plants are often the ferns, common polypody (Polypodium vulgare) and rusty woodsia (Woodsia ilvensis), along with herbs such as columbine (Aquilegia canadensis), harebell (Campanula rotundifolia), pale corydalis (Corydalis sempervirens), juneberry (Amelanchier spp.), bush-honeysuckle (Diervilla lonicera), and rock spikemoss (Selaginella rupestris).

Dry Prairie

This grassland community occurs on dry, often loess-derived soils, usually on steep south or west facing slopes or at the summits of river bluffs with sandstone or dolomite near the surface. Short to medium-sized prairie grasses: little bluestem (Schizachyrium scoparium), side-oats grama (Bouteloua curtipendula), hairy grama (B. hirsuta), and prairie dropseed (Sporobolus heterolepis), are the dominants in this community. Common shrubs

and forbs include lead plant (Amorpha canescens), silky aster (Aster sericeus), flowering spurge (Euphorbia corollata), purple prairie-clover (Petalostemum purpureum), cylindrical blazing-star (Liatris cylindracea), and gray goldenrod (Solidago nemoralis). Stands on gravelly knolls in the Kettle Moraine region of southeastern Wisconsin and along the St. Croix River on the Minnesota – Wisconsin border may warrant recognition, at least at the subtype level.

Dry-Mesic Prairie

This grassland community occurs on slightly less droughty sites than Dry Prairie and has many of the same grasses, but taller species such as big bluestem (Andropogon gerardii) and Indian-grass (Sorghastrum nutans) dominate. Needle grass (Stipa spartea) may also be present. The herb component is more diverse than in Dry Prairies, including many species that occur in both Dry and Mesic Prairies.

Emergent Aquatic

These open, marsh, lake, riverine and estuarine communities with permanent standing water are dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures. Dominants include cat-tails (Typha spp.), bulrushes (particularly Scirpus acutus, S. fluviatilis, and S. validus), bur-reeds (Sparganium spp.), giant reed (Phragmites australis), pickerel-weed (Pontederia cordata), water-plantains (Alisma spp.), arrowheads (Sagittaria spp.), and the larger species of spikerush such as (Eleocharis smallii).

Emergent Aquatic - Wild Rice

This open community is an emergent macrophyte type, with wild rice (Zizania aquatica or Z. palustris) as the dominant species. The substrate usually consists of poorly-consolidated, semi-organic sediments. Water fertility is low to moderate, and a slow current is present. Wild rice beds have great cultural significance to native peoples, and are important wildlife habitats.

Ephemeral Pond

These ponds are depressions with impeded drainage (usually in forest landscapes), that hold water for a period of time following snowmelt but typically dry out by mid-summer. Common aquatic plants of these habitats include yellow water crowfoot (Ranunculus flabellaris), mermaid weed (Proserpinaca palustris), Canada bluejoint grass (Calamagrostis canadensis), floating manna grass (Glyceria septentrionalis), spotted cowbane (Cicuta maculata), smartweeds (Polygonum spp.), orange jewelweed (Impatiens capensis), and sedges. Ephemeral ponds provide critical breeding habitat for certain invertebrates, as well as for many amphibians such as frogs and salamanders.

Felsenmeer

This rare open primary community consists of steep slopes of quartzite or other metamorphic rock boulders (.25 - 1 meters in diameter) formed by periglacial frost and ice-wedging, and characterized by cool, moist air drainage at or near their base. The vegetation is fairly sparse but may be structurally variable. Lichens especially (Lasallia) are the dominant cover on the boulders. Scattered soil pockets may occur and support scattered white and red pines (Pinus strobus and P. resinosa) often in association with mossy beds of common polypody (Polypodium virginianum) or marginal shield fern (Dryopteris marginalis). The slope base in the zone of cool air drainage is typically shrub dominated, and may include a number of species somewhat disjunct from their more northern ranges, such as squashberry (Viburnum edule), Canada gooseberry (Ribes oxyacanthides). Other frequently occurring shrub or small tree species are Labrador-tea (Ledum groenlandicum), mountain maple (Acer spicatum), mountain ash (Sorbus spp.) and red-berried elder (Sambucus pubens). The vine, purple clematis (Clematis occidentalis) and tree, balsam fir (Abies balsamea) may also be present. This community type has been incompletely surveyed and occurrences should be carefully examined for rare bryophytes, lichens and terrestrial snails.

Floodplain Forest (replaces in part the **Southern Wet** and **Southern Wet-Mesic Forests** of Curtis**)**

This is a lowland hardwood forest community that occurs along large rivers, usually stream order 3 or higher, that flood periodically. The best-development occurs along large rivers in southern Wisconsin, but this community is also found in the north. Canopy dominants may include silver maple (Acer saccharinum), river birch (Betula nigra), green ash (Fraxinus pennsylvanica), hackberry (Celtis occidentalis), swamp white oak (Quercus bicolor), and cottonwood (Populus deltoides). Northern stands are often species poor, but balsam-poplar (Populus balsamifera), bur oak (Quercus macrocarpa), and box elder (Acer negundo) may replace some of the missing "southern" trees. Buttonbush (Cephalanthus occidentalis) is a locally dominant shrub and may form dense thickets on the margins of oxbow lakes, sloughs and ponds within the forest. Nettles (Laportea canadensis and Urtica dioica), sedges, ostrich fern (Matteuccia struthiopteris) and gray-headed coneflower (Rudbeckia laciniata) are important understory herbs, and lianas such as Virginia creepers (Parthenocissus spp.), grapes (Vitis spp.), Canada moonseed (Menispermum canadense), and poison-ivy (Toxicodendron radicans) are often common. Among the striking and characteristic herbs of this community are cardinal flower (Lobelia cardinalis) and green dragon (Arisaema dracontium).

Forested Ridge and Swale (now called **Great Lakes Ridge and Swale**)

Forested Seep

These are shaded seepage areas with active spring discharges in (usually) hardwood forests that may host a number of uncommon to rare species. The overstory dominant is frequently black ash (Fraxinus nigra), but yellow birch (Betula allegheniensis), American elm (Ulmus americana) and many other tree species may be present including conifers such as hemlock (Tsuga canadensis) or white pine (Pinus strobus). Understory species include skunk cabbage (Symplocarpus foetidus), water-pennywort (Hydrocotyle americana), marsh blue violet (Viola cucullata), swamp saxifrage (Saxifraga pennsylvanica), golden saxifrage (Chysosplenium americanum), golden ragwort (Senecio aureus), silvery spleenwort (Athyrium thelypterioides) and the rare sedges (Carex scabrata and C. prasina). Most documented occurrences are in the Driftless Area, or locally along major rivers flanked by steep bluffs.

Great Lakes Alkaline Rockshore

These creviced, wave-splashed, nearly horizontal dolomite ledges are restricted geographically to shoreline exposures along Lake Michigan on the northern Door Peninsula. Depending on lake levels, large expanses of this habitat may be either inundated or exposed during a given year. Common members of this community are the shrubs ninebark (Physocarpus opulifolius), shrubby cinquefoil (Potentilla fruticosa), and the herbs silverweed (Potentilla anserina), goldenrods (especially Solidago hispida), brook lobelia (Lobelia kalmii), gentians (Gentiana spp.), grasses-of Parnassus (Parnassia spp.), Indian paint-brush (Castilleja coccinea), low calamint (Calamintha arkansana) and many other calciphiles. Plants endemic to the Great Lakes shores are significant components of some stands.

Great Lakes Barrens

In Wisconsin, this variant of pine savanna is known from only one sandy site on Lake Superior. The dominant trees in this open stand are wind- and fire-deformed trees, red pines (Pinus resinosa) with white pine (P. strobus) also present. The understory consists of dense growths of lichens with scattered thickets of common juniper (Juniperus communis), early blueberry (Vaccinium angustifolium) and huckleberry (Gaylussacia baccata). Other common plants are hairgrass (Deschampsia flexuosa), ticklegrass (Agrostis hyemalis), false-heather (Hudsonia tomentosa), and bearberry (Arctostaphylos uva–ursi).

Great Lakes Beach

This beach community usually occurs in association with active dune systems. The beaches of the Great Lakes are extremely dynamic features, strongly influenced by water level changes and storm events. They support a suite of very specialized organisms, although unprotected shorelines may be entirely unvegetated. The plant species found in this community include (along Lake Michigan) seaside spurge (Euphorbia polygonifolia) and American sea-rocket (Cakile edentula).

Great Lakes Dune (formerly called Lake Dune)

The dominant plant in these semi-stabilized, open dunes along Great Lakes shorelines, is usually the sand-binding marram grass (Ammophila breviligulata). Frequent associates are common juniper (Juniperus communis), Canada wild-rye (Elymus canadensis), false-heather (Hudsonia tomentosa), beach-pea (Lathyrus japonicus), beach wormwood (Artemisia campestris), sand cherry (Prunus pumila), and various willows (Salix spp.). Two plants endemic to the Great Lakes region, pitcher's thistle (Cirsium pitcheri) and Lake Huron tansy (Tanacetum huronense; possibly now extirpated in Wisconsin), occur in this community along Lake Michigan.

Great Lakes Ridge and Swale (Formerly **Forested Ridge and Swale**)

This is a complex of semi- to fully-stabilized, often forested beach / dune ridges alternating with wet open to forested swales, found on the shores of the Great Lakes but best-developed along Lake Michigan. Both parallel the coast and offer exceptionally complex and diverse habitats for wetland, upland, and Great Lakes shoreline plants. Ridges may support assemblages similar to boreal, northern mesic, or northern dry-mesic forests. Water depth is a controlling factor in the swales, and the vegetation may run the gamut from open (emergent marsh, fen, or sedge meadow), shrub (bog birch, alder), or forested wetlands (often white cedar, black ash are prominent in these).

Hardwood Swamp (this is a split from Curtis' **Northern Wet-Mesic Forest**)

These are northern deciduous forested wetlands that occur along lakes or streams, or in insular basins in poorly drained morainal landscapes. The dominant tree species is black ash (Fraxinus nigra), but in some stands red maple (Acer rubrum), yellow birch (Betula allegheniensis), and (formerly) American elm (Ulmus americana) are also important. The tall shrub speckled alder (Alnus incana) may be locally common. The herbaceous flora is often diverse and may include many of the same species found in Alder Thickets. Typical species are marsh-marigold (Caltha palustris), swamp raspberry (Rubus pubescens), skullcap (Scutellaria galericulata), orange jewelweed (Impatiens capensis), and many sedges (Carex spp.). Soils may be mucks or mucky sands.

Hemlock Relict

These are isolated hemlock (Tsuga canadensis) stands occuring in deep, moist ravines or on cool, north or east facing slopes in southwestern Wisconsin. Associated trees include white pine (Pinus strobus), and yellow birch (Betula allegheniensis). The groundlayer includes herbaceous species with northern affinities such as shining clubmoss (Lycopodium lucidulum), bluebead lily (Clintonia borealis), canada mayflower (Maianthemum canadense), and woodferns (Dryopteris spp). Cambrian sandstone cliffs are usually nearby and often prominent.

Interdunal Wetland

Wind-created hollows that intersect the water table within active dune fields along the Great Lakes. These maybe colonized by wetland plants, including habitat specialists that are of high conservation significance. Common members of this wetland community on Lake Superior are twig-rush (Cladium mariscoides), species of rushes (especially Juncus balticus), pipewort (Eriocaulon septangulare), the sedge (Carex viridula), ladies-tress orchids (Spiranthes sp.) and bladderworts (Utricularia cornuta and U. resupinata).

Inland Beach

The beaches of inland lakes that experience enough water level fluctuation to prevent the development of a stable shoreline forest or other community may, instead support a specialized biota adapted to sandy or gravelly littoral habitats. The shorelines of such lakes (usually seepage lakes) may be subject to fluctuations of as much as several meters over a few years or decades. The alternation of high and low periods maintains populations of the beach specialists over time, including some rare species of unusual geographic affinity such as the Atlantic Coastal Plain of the eastern United States.

Lake Dune (see Great Lakes Dune)

Mesic Cedar Forest

This is a rare upland forest community of mesic sites in northern Wisconsin, characterized by white cedar (Thuja occidentalis) and various associates including hemlock (Tsuga canadensis), white spruce (Abies balsamea), yellow birch (Betula alleghanensis), and white pine (Pinus strobus). The herb layer may contain canada mayflower (Maianthemum canadense), twinflower (Linnaea borealis), clubmosses (Lycopodium spp.), and others. More information is needed on this community type.

Mesic Floodplain Terrace

These are deciduous forests developed on alluvial terraces along rich, infrequently flooding (or flooding only for a very short period) rivers draining into Lake Superior. The dominant trees are usually sugar maple (Acer saccharum), basswood (Tilia americana), and sometimes ashes (Fraxinus spp.). There is a diverse spring ephemeral flora (which in Wisconsin includes many southern species at their northern range limits), but by late spring, these may be overtopped by dense stands of ostrich fern (Matteuccia struthiopteris) and wood-nettle (Laportea canadensis).

Mesic Prairie

This grassland community occurs on rich, moist, well-drained sites. The dominant plant is the tall grass, big bluestem (Andropogon gerardii). The grasses little bluestem (Andropogon scoparius), indian grass (Sorghastrum nutans), porcupine grass (Stipa spartea), prairie dropseed (Sporobolus heterolepis), and tall switchgrass (Panicum virgatum) are also frequent. The forb layer is diverse in the number, size, and physiognomy of the species. Common taxa include the prairie docks (Silphium spp.), lead plant (Amorpha canescens), heath and smooth asters (Aster ericoides and A. laevis), sand coreopsis (Coreopsis palmata), prairie sunflower (Helianthus laetiflorus), rattlesnake-master (Eryngium yuccifolium), flowering spurge (Euphorbia corollata), beebalm (Monarda fistulosa), prairie coneflower (Ratibida pinnata), and spiderwort (Tradescantia ohioensis).

Moist Cliff (**Shaded Cliff** of the Curtis community classification)

This "micro-community" occurs on shaded (by trees or the cliff itself because of aspect), moist to seeping mossy, vertical exposures of various rock types, most commonly sandstone and dolomite. Common species are columbine (Aquilegia canadensis), the fragile ferns (Cystopteris bulbifera and C. fragilis), wood ferns (Dryopteris spp.), rattlesnake-root (Prenanthes alba), and wild sarsaparilla (Aralia nudicaulis). The rare flora of these cliffs vary markedly in different parts of the state; Driftless Area cliffs might have northern monkshood (Aconitum noveboracense), those on Lake Superior, butterwort (Pinguicula vulgaris), or those in Door County, green spleenwort (Asplenium viride).

Moist Sandy Meadow (formerly called Sand Meadow)
This type is included primarily as a placeholder for anomalous herb-dominated assemblages on moist sandy soils in central Wisconsin. Available descriptive information is very limited at this time. Stand size is generally small, seldom, if ever, exceeding more than a few acres. The flora consists of a mixture of plant species typically found in wet prairie, sedge meadow, coastal plain marsh, and pine or oak barrens communities. No one group of associates is clearly dominant. Past human disturbance is evident in some occurrences but native species are prevalent.

Due to a high water table, stands are subject to periodic inundation for short periods of time in the spring and following heavy rain events. This dynamic appears to be at least partially responsible for maintaining the type, but periodic fire, mowing, and browsing may also be important factors.

Muskeg

Muskegs are cold, acidic, sparsely wooded northern peatlands with **composition** similar to the Open Bogs (Sphagnum spp. mosses, Carex spp., and ericaceous shrubs), but with scattered stunted trees of black spruce (Picea mariana) and tamarack (Larix laricina). Plant diversity is typically low, but the community is important for a number of boreal bird and butterfly species, some of which are quite specialized and not found in other communities.

Northern Dry Forest

This forest community occurs on nutrient-poor sites with excessively drained sandy or rocky soils. The primary historic disturbance regime was catastrophic fire at intervals of decades to approximately a century. Dominant trees of mature stands include jack and red pines (Pinus banksiana and P. resinosa) and/or Hill's oak (Quercus ellipsoidalis). Large acreages of this forest type were cut and burned during the catastrophic logging of the late 19th and early 20th century. Much of this land was then colonized by white birch (Betula papyrifera) and/or quaking aspen (Populus tremuloides), or converted **to** pine plantations starting in the 1920s. Common understory shrubs are hazelnuts (Corylus spp.), early blueberry (Vaccinium angustifolium) and brambles (Rubus spp.); common herbs include bracken fern (Pteridium aquilinium), starflower (Trientalis borealis), barren-strawberry (Waldsteinia fragarioides), cow-wheat (Melampyrum lineare), trailing arbutus (Epigaea repens), and members of the shinleaf family (Chimaphila umbellata, Pyrola spp.). Vast acreages of open "barrens" were also planted to pine, or naturally succeeded to densely stocked “dry” forests.

Northern Dry-Mesic Forest

In this forest community, mature stands are dominated by white and red pines (Pinus strobus and P. resinosa), sometimes mixed with red oak (Quercus rubra) and red maple (Acer rubrum). Common understory shrubs are hazelnuts (Corylus spp.), blueberries (Vaccinium angustifolium and V. myrtilloides), wintergreen (Gaultheria procumbens), partridge-berry (Mitchella repens); among the dominant herbs are wild sarsaparilla (Aralia nudicaulis), Canada mayflower (Maianthemum canadense), and cow-wheat (Melampyrum lineare). Stands usually occur on sandy loams, sands or sometimes rocky soils.

Northern Mesic Forest

This forest complex covered the largest acreage of any Wisconsin vegetation type prior to European settlement. Sugar maple (Acer saccharum) is dominant or co-dominant in most stands, while hemlock (Tsuga canadensis) was the second most important species, sometimes occurring in nearly pure stands with white pine (Pinus strobus). Beech (Fagus grandifolia) can be a co-dominant with sugar maple in the counties near Lake Michigan. Other important tree species were yellow birch (Betula allegheniensis), basswood (Tilia americana), and white ash (Fraxinus americana). The groundlayer varies from sparse and species poor (especially in hemlock stands) with woodferns (especially Dryopteris intermedia), bluebead lily (Clintonia borealis), clubmosses (Lycopodium spp.), and Canada mayflower (Maianthemum canadense) prevalent, to lush and species-rich with fine spring ephemeral displays. After old-growth stands were cut, trees such as quaking and bigtoothed aspens (Populus tremuloides and P. grandidentata), white birch (Betula papyrifera), and red maple (Acer rubrum) became and still are important in many second-growth Northern Mesic Forests. Several distinct associations within this complex warrant recognition as communities, and draft abstracts of these are currently undergoing review.

Northern Sedge Meadow

This open wetland community is dominated by sedges and grasses. There are several common subtypes: Tussock meadows, dominated by tussock sedge (Carex stricta) and Canada bluejoint grass (Calamagrostis canadensis); Broad-leaved sedge meadows, dominated by the robust sedges (Carex lacustris and**/or** C. utriculata); and Wire-leaved sedge meadows, dominated by such species as woolly sedge (Carex lasiocarpa) and few-seeded sedge (C. oligosperma). Frequent associates include marsh bluegrass (Poa palustris), manna grasses (Glyceria spp.), panicled aster (Aster lanceolatus), joy-pye-weed (Eupatorium maculatum), and the bulrushes (Scirpus atrovirens and S. cyperinus).

Northern Wet Forest (revised from Curtis, with **Black Spruce** and **Tamarack Swamps** split out)

These weakly minerotrophic conifer swamps, located in the North, are dominated by black spruce (Picea mariana) and tamarack (Larix laricina). Jack pine (Pinus banksiana) may be a significant canopy component in certain parts of the range of this community complex. Understories are composed mostly of sphagnum (Sphagnum spp.) mosses and ericaceous shrubs such as leatherleaf (Chamaedaphne calyculata), Labrador-tea (Ledum groenlandicum), and small cranberry (Vaccinium oxycoccos) and sedges such as (Carex trisperma and C paupercula). The Natural Heritage Inventory has split out two entities, identified (but not strictly defined) by the two dominant species (see **Black Spruce Swamp** and **Tamarack Swamp**).

Northern Wet-Mesic Forest (revised from Curtis, with **Northern Hardwood Swamp** split out)

This forested minerotrophic wetland is dominated by white cedar (Thuja occidentalis), and occurs on rich, neutral to alkaline substrates. Balsam fir (Abies balsamea), black ash (Fraxinus nigra), and spruces (Picea glauca and P. mariana) are among the many potential canopy associates. The understory is rich in sedges (such as Carex disperma and C. trisperma), orchids (e.g., Platanthera obtusata and Listera cordata), and wildflowers such as goldthread (Coptis trifolia), fringed polygala (Polygala pauciflora), and naked miterwort (Mitella nuda), and trailing sub-shrubs such as twinflower (Linnaea borealis) and creeping snowberry (Gaultheria hispidula). A number of rare plants occur more frequently in the cedar swamps than in any other habitat.

Oak Barrens

Black oak (Quercus velutina) is the dominant tree in this fire-adapted savanna community of xeric sites, but other oaks may also be present. Common understory species are lead plant (Amorpha canescens), black-eyed susan (Rudbeckia hirta), round-headed bush clover (Lespedeza capitata), goat's rue (Tephrosia virginiana), june grass (Koeleria cristata), little bluestem (Schizachyrium scoparium), flowering spurge (Euphorbia corollata), frostweed (Helianthemum canadense), false Solomon's-seals (Smilacina racemosa and S. stellata), spiderwort

(Tradescantia ohioensis), and lupine (Lupinus perennis). Distribution of this community is mostly in southwestern, central and west central Wisconsin.

Oak Opening

As defined by Curtis, this is an oak-dominated savanna community in which there is less than 50% tree canopy. Historically, oak openings occurred on wet-mesic to dry sites. The few extant remnants are mostly on drier sites, with the mesic and wet-mesic openings almost totally destroyed by conversion to agricultural or residential uses, and by the encroachment of other woody plants due to fire suppression. Bur, white, and black oaks (Quercus macrocarpa, Q. alba and Q. velutina) are dominant in mature stands as large, open-grown trees with distinctive limb architecture. Shagbark hickory (Carya ovata) is sometimes present. American hazelnut (Corylus americana) is a common shrub, and while the herblayer is similar to those found in oak forests and prairies, with many of the same grasses and forbs present, there are some plants and animals that reach their optimal abundance in the "openings".

Oak Woodland

This "forest" community is structurally intermediate between Oak Openings and Southern Dry Forest. The tree canopy cover is high, but frequent low-intensity fires and possibly (in pre-settlement times) browsing by herbivores such as elk, bison, and deer kept the understory relatively free of shrubs and saplings. Much additional information is needed but it appears that at least some plants (certain legumes, grasses, and composites among them) reached their highest abundance here.

Open Bog

These non-forested bogs are acidic, low nutrient, northern Wisconsin peatlands dominated by Sphagnum spp. mosses that occur in deep layers, often with pronounced hummocks and hollows. Also present are a few narrow-leaved sedge species such as (Carex oligosperma and C. pauciflora), cotton-grasses (Eriophorum spp.), and ericaceous shrubs, especially bog laurel (Kalmia polifolia), leatherleaf (Chamaedaphne calyculata), and small cranberry (Vaccinium oxycoccus). Plant diversity is very low but includes characteristic and distinctive specialists. Trees are absent or achieve very low cover values as this community is closely related to and intergrades with Muskeg. When this community occurs in southern Wisconsin, it is often referred to as a **Bog Relict**.

Patterned Peatland

Very rare in Wisconsin, this wetland type can be characterized as a herb- and shrub-dominated minerotrophic peatland with alternating moss and sedge-dominated peat ridges (strings) and saturated and inundated hollows (flarks). These are oriented parallel to the contours of a slope and perpendicular to the flow of groundwater. Within a patterned peatland the peat "landforms" differ significantly in nutrient availability and pH. The flora may be quite diverse and includes many sedges of bogs and fens, along with ericads, sundews, orchids, arrow-grasses (Triglochin spp.), and calciphilic shrubs such as bog birch (Betula pumila) and shrubby cinquefoil (Potentilla fruticosa).

Pine Barrens

This savanna community is characterized by scattered jack pines (Pinus banksiana), or less commonly red pines (P. resinosa), sometimes mixed with scrubby Hill's and bur oaks (Quercus ellipsoidalis and Q. macrocarpa), interspersed with openings in which shrubs such as hazelnuts, (Corylus spp.) and prairie willow (Salix humilis) and herbs dominate. The flora often contains species characteristic of "heaths" such as blueberries (Vaccinium angustifolium and V. myrtilloides), bearberry (Arctostaphylos uva-ursi), American hazelnut (Corylus americana), sweet fern (Comptonia peregrina), and sand cherry (Prunus pensylvanica). Also present are dry sand prairie species such as june grass (Koeleria macrantha), little bluestem (Schizachyrium scoparium), silky

and sky-blue asters (Aster sericeus and A. azureus), lupine (Lupinus perennis), blazing-stars (Liatris aspera and L. cylindracea), and western sunflower (Helianthus occidentalis). Pines may be infrequent, even absent, in some stands in northern Wisconsin and elsewhere because of past logging, altered fire regimes, and an absence of seed source.

Pine Relict

These isolated stands of white pine (Pinus strobus) and red pine (P. resinosa) or, less commonly, jack pine (P.banksiana), that occur on sandstone outcrops or in thin soils over sandstone in the Driftless Area of southwestern Wisconsin, have historically been referred to as relicts. The understories often contain species with northern affinities such as blueberries (Vaccinium spp.), huckleberry (Gaylussacia baccata), wintergreen (Gaultheria procumbens), pipsissewa (Chimaphila umbellata), and partridge-berry (Mitchella repens), sometimes mixed with herbs typically found in southern Wisconsin's oak forests and prairies.

Poor Fen

This acidic, weakly minerotrophic peatland type is similar to the Open Bog, but can be differentiated by higher pH, nutrient availability, and floristics. Sphagnum (Sphagnum spp.) mosses are common but don't typically occur in deep layers with pronounced hummocks. Floristic diversity is higher than in the Open Bog and may include white beak-rush (Rhynchospora alba), pitcher-plant (Sarracenia purpurea), sundews (Drosera spp.), pod grass (Scheuchzeria palustris), and the pink-flowered orchids (Calopogon tuberosus, Pogonia ophioglossoides and Arethusa bulbosa). Common sedges are (Carex oligosperma, C. limosa, C. lasiocarpa, C. chordorrhiza), and cotton-grasses (Eriphorum spp.).

Sand Barrens

Sand Barrens are herbaceous upland communities that develop on unstable or semi-stabilized alluvial sands along major rivers such the Mississippi and Wisconsin. They are partly or perhaps wholly anthropogenic in origin, occurring on sites historically disturbed by plowing or very heavy grazing. Unvegetated "blow-outs" are characteristic features. Barrens, Dry Prairie and Sand Prairie species such as false-heather (Hudsonia tomentosa), bearberry (Arctostaphylos uva-ursi), sedges (Cyperus filiculmis and C. schweinitzii), sand cress (Arabis lyrata), three-awn grasses (Aristida spp.), rock spikemoss (Selaginella rupestris), and the earthstar fungi (Geaster spp.) are present in this community. Many exotics are present, and rare disturbance dependent species such as fameflower (Talinum rugospermum) occur in some stands.

Sand Meadow (now called Moist Sand Meadow)

Sand Prairie (or Dry Sand Prairie)

This dry grassland community is composed of little bluestem (Schizachyrium scoparium), junegrass (Koeleria macrantha), panic grass (Panicum spp.), and crab grass (Digitaria cognata). Common herbaceous species are western ragweed (Ambrosia psilostachya), the sedges (Carex muhlenbergii and C. pensylvanica), poverty-oat grass (Danthonia spicata), flowering spurge (Euphorbia corollata), frostweed (Helianthemum canadense), common bush-clover (Lespedeza capitata), false-heather (Hudsonia tomentosa), long-bearded hawkweed (Hieracium longipilum), stiff goldenrod (Solidago rigida), horsebalm (Monarda punctata), and spiderwort (Tradescantia ohioensis). At least some stands are Barrens remnants now lacking appreciable woody cover, though extensive stands may have occurred historically on broad level terraces along the Mississippi, Wisconsin, Black, and Chippewa Rivers.

Shore Fen (formerly called Coastal Fen)

This open peatland community occurs primarily along Great Lakes shorelines, especially near the mouths of estuarine streams. Along Lake Superior most stands are separated from the lake waters by a sand spit. The

floating sedge mat is composed mostly of woolly sedge (Carex lasiocarpa); co-dominants are sweet gale (Myrica gale) and bogbean (Menyanthes trifoliata). The following herbs are common in this diverse, circumneutral, nutrient-rich community: twigrush (Cladium mariscoides), marsh horsetail (Equisetum fluviatile), a spikerush (Eleocharis elliptica), intermediate bladderwort (Utricularia intermedia), marsh bellflower (Campanula aparinoides), narrow-leaved willow-herb (Epilobium leptophyllum), water-parsnip (Sium suave), and bog willow (Salix pedicellaris). Coastal fens are distinguished from open bogs and poor fens (which may adjoin them in the same wetland complex) by the lack of Sphagnum spp. mosses, higher pH, and direct hydrologic connection to the Great Lakes. They are distinguished from rich fens by the absence of indicator species such as linear-leaved sundew (Drosera linearis), grass-of-parnassus (Parnassia glauca), false asphodel (Tofiedia glutinosa) and a spikerush (Eleocharis rostellata).

Shrub-Carr

This wetland community is dominated by tall shrubs such as red-osier dogwood (Cornus stolonifera), meadow-sweet (Spiraea alba), and various willows (Salix discolor, S. bebbiana, and S. gracilis). Canada bluejoint grass (Calamagrostis canadensis) is often very common. Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

Southern Dry Forest

Oaks are the dominant species in this upland forest community of dry sites. White oak (Quercus alba) and black oak (Quercus velutina) are dominant, often with admixtures of red and bur oaks (Q. rubra and Q. macrocarpa) and black cherry (Prunus serotina). In the well developed shrub layer, brambles (Rubus spp.), gray dogwood (Cornus racemosa), and American hazelnut (Corylus americana) are common. Frequent herbaceous species are wild geranium (Geranium maculatum), false Solomon's-seal (Smilacina racemosa), hog-peanut (Amphicarpaea bracteata), and woodland sunflower (Helianthus strumosus).

Southern Dry-Mesic Forest

Red oak (Quercus rubra) is a common dominant tree of this upland forest community type. White oak (Q. alba), basswood (Tilia americana), sugar and red maples (Acer saccharum and A. rubrum), and white ash (Fraxinus americana) are also important. The herbaceous understory flora is diverse and includes many species listed under Southern Dry Forest plus jack-in-the-pulpit (Arisaema triphyllum), enchanter's-nightshade (Circaea lutetiana), large-flowered bellwort (Uvularia grandiflora), interrupted fern (Osmunda claytoniana), Lady Fern (Athyrium Filix-femina), tick-trefoils (Desmodium glutinosum and D. nudiflorum), and hog peanut (Amphicarpa bracteata) . To the detriment of the oaks, mesophytic tree species are becoming increasingly important under current management practices and fire suppression policies.

Southern Hardwood Swamp (A split from Curtis' **Southern Wet-Mesic Forest**)

This is a deciduous forested wetland community type found in insular basins with seasonally high water tables. It is best developed in glaciated southeastern Wisconsin. The dominant trees are red maple (Acer rubrum), green ash (Fraxinus pennsylvanica), and formerly**,** American elm (Ulmus americana). The exotic reed canary grass (Phalaris arundinacea) is often dominant in the understory. This Natural Heritage Inventory community partly includes the **Southern Wet-Mesic Forest** of the Curtis classification.

Southern Mesic Forest

This upland forest community occurs on rich, well-drained soils. The dominant tree species is sugar maple (Acer saccharum), but basswood (Tilia americana) and (near Lake Michigan) beech (Fagus grandifolia) may be co-dominant. Many other trees are found in these forests, including those of the walnut family (Juglandaceae). The understory is typically open (sometimes brushy with species of gooseberry (Ribes) if there is a past history

of grazing) and supports fine spring ephemeral displays. Characteristic herbs are spring-beauty (Claytonia virginica), trout-lilies (Erythronium spp.), trilliums (Trillium spp.), violets (Viola spp.), bloodroot (Sanguinaria canadensis), blue cohosh (Caulophyllum thalictroides), mayapple (Podophyllum peltatum), and Virginia waterleaf (Hydrophyllum virginianum).

Southern Sedge Meadow

Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge (Carex stricta) and Canada bluejoint grass (Calamagrostis canadensis). Common associates are water-horehound (Lycopus uniflorus), panicled aster (Aster simplex), blue flag (Iris virginica), Canada goldenrod (Solidago canadensis), spotted joe-pye-weed (Eupatorium maculatum), broad-leaved cat-tail (Typha latifolia), and swamp milkweed (Asclepias incarnata). Reed canary grass (Phalaris arundinacea) may be dominant in grazed and/or ditched stands. Ditched stands can succeed quickly to Shrub-Carr.

Submergent Aquatic

This herbaceous community of aquatic macrophytes occurs in lakes, ponds, and rivers. Submergent macrophytes often occur in deeper water than emergents, but there is considerable overlap. Dominants include various species of pondweeds (Potamogeton spp.) along with waterweed (Elodea canadensis), slender naiad (Najas flexilis), eel-grass (Vallisneria americana), and species of water-milfoil (Myriophyllum) and bladderworts (Utricularia).

Submergent Aquatic – Oligotrophic marsh (formerly called Submergent Aquatic – Oligotrophic)

This herbaceous community of distinctive highly specialized submersed, rosette-forming aquatic macrophytes occurs in clear, deep soft-water lakes in northern Wisconsin. The plants grow at depths ranging from the beach line to several meters. Species in this community include American shore-grass (Littorella americana), pipewort (Eriocaulon septangulare), yellow hedge-hyssop (Gratiola aurea), aquatic lobelia (Lobelia dortmanna), a milfoil (Myriophyllum tenellum), brown-fruit rush (Juncus pelocarpus), and quillworts (Isoetes spp.).

Talus Forest

This description is based on a very limited number of stands examined and should be regarded as preliminary. Talus Forest develops on a substrate of quartzite, sandstone, dolomite, rhyolite, and possibly other rock types. Canopy cover ranges from sparse to moderately dense. Tree dominance is variable, and can include white pine (*Pinus strobus*), red cedar (J*uniperus virginiana*), paper birch (*Betula papyrifera*), northern white cedar (*Thuja occidentalis*), red pine (*Pinus resinosa*) and others. Among the characteristic understory plants noted to date are the shrubs mountain maple (*Acer spicatum*), red-berried elder (*Sambucus pubens*), and bristly sarsaparilla (*Aralia hispida*). Representative herbs include common polypody (*Polypodium vulgare*), wood fern (*Dryopteris marginalis*), walking fern (*Asplenium rhizophyllum*), harebell (*Campanula rotundifolia*), columbine (*Aquilegia canadensis*), fumitory (*Adlumia fungosa*), leafcup (*Polymnia canadensis*),and pale corydalis (*Corydalis sempervirens*). Crustose lichens and various mosses sometimes reach high cover values.

Talus Forest communities often reflect the composition of forests in the surrounding landscape, but include plants and animals that are adapted to take advantage of the rock substrate, microclimatic conditions such as cold air drainage, and groundwater seepage. These habitat specialists, presumably including some of the mosses and lichens, are likely to be the species that are most restricted to such environments and of the greatest conservation concern.

Tamarack (poor) Swamp (formerly called Tamarack Swamp, this is a split from Curtis' **Northern Wet Forest**)

These weakly to moderately minerotrophic conifer swamps are dominated by a broken to closed canopy of tamarack (Larix laricina) and a frequently dense understory of speckled alder (Alnus incana). The understory is more diverse than in Black Spruce Swamps and may include more nutrient-demanding species such as winterberry holly (Ilex verticillata) and black ash (Fraxinus nigra). The bryophytes include many genera other than Sphagnum. Stands with spring seepage sometimes have marsh-marigold (Caltha palustris) and skunk-cabbage (Symplocarpus foetidus) as common understory inhabitats. These seepage stands have been separated out as a distinct type or subtype in some nearby states and provinces.

Tamarack (rich) Swamp (formerly called Tamarack Fen)

This forested wetland community type is a variant of the Tamarack Swamp, but occurs south of the Tension Zone within a matrix of "southern" vegetation types. Poison-sumac (Toxicodendron vernix) is often a dominant understory shrub. Successional stages and processes are not well understood but fire, windthrow, water level fluctuations, and periodic infestations of larch sawfly are among the important dynamic forces influencing this community. Groundwater seepage influences the composition of most if not all stands. Where the substrate is especially springy, skunk cabbage (Symplocarpus foetidus), marsh marigold Caltha palustris), sedges, and a variety of mosses may carpet the forest floor. Drier, more acid stands may support an ericad and sphagnum dominated groundlayer.

Wet Prairie

This is a rather heterogeneous tall grassland community that shares characteristics of prairies, Southern Sedge Meadow, Calcareous Fen and even Emergent Aquatic communities. The Wet Prairie's more wetland- like character can mean that sometimes very few true prairie species are present. Many of the stands assigned to this type by Curtis are currently classified as Wet-Mesic Prairies. The dominant graminoids are Canada bluejoint grass (Calamagrostis canadensis), cordgrass (Spartina pectinata), and prairie muhly (Muhlenbergia glomerata), plus several sedge (Carex) species including lake sedge (C. lacustris), water sedge (C. aquatilis), and woolly sedge (C. lanuginosa). Many of the herb species are shared with Wet-Mesic Prairies, but the following species are often prevalent: New England aster (Aster novae-angliae), swamp thistle (Cirsium muticum), northern bedstraw (Galium boreale), yellow stargrass (Hypoxis hirsuta), cowbane (Oxypolis rigidior), tall meadow-rue (Thalictrum dasycarpum), golden alexander (Zizea aurea), and mountain-mint (Pycnanthemum virginianum).

Wet-Mesic Prairie

This herbaceous grassland community is dominated by tall grasses including big bluestem (Andropogon gerardii), Canada bluejoint grass (Calamagrostis canadensis), cordgrass (Spartina pectinata), and Canada wild-rye (Elymus canadensis). The forb component is diverse and includes azure aster (Aster oolentangiensis), shooting-star (Dodecatheon meadia), sawtooth sunflower (Helianthus grosseseratus), prairie blazing-star (Liatris pycnostachya), prairie phlox (Phlox pilosa), prairie coneflower (Ratibida pinnata), prairie docks (Silphium integrifolium and S. terebinthinaceum), late and stiff goldenrods (Solidago gigantea and S. rigida), and culver's-root (Veronicastrum virginicum).

White Pine - Red Maple Swamp

This swamp community is restricted to the margins of the bed of extinct glacial Lake Wisconsin in the central part of the state. It often occurs along headwaters stream**s** and seepages in gently sloping areas. White pine (Pinus strobus) and red maple (Acer rubrum) are the dominant trees, with other species, including yellow birch (Betula alleghiensis), present in lesser amounts. Common understory shrubs are speckled alder (Alnus incana), winterberry holly (Ilex verticillata), and swamp dewberry (Rubus pubescens); characteristic herbs include skunk cabbage (Symplocarpus foetidus), cinnamon fern (Osmunda cinnamomea), gold thread (Coptis trifolia), and two

disjuncts from the eastern United States, bog fern (Thelypteris simulata) and long sedge (Carex folliculata). Sphagnum and other mosses are common.